

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-12 (Canceled) ✓

2. 13. (Currently amended) A method for diagnosing mastitis of cows set forth in claim 12, ~~comprising the steps of irradiating~~ ¹ 35, wherein the urine, raw milk or a mammary gland is irradiated with near infrared rays in a wavelength range of 700 nm to 2500 nm, ~~into urine, raw milk or a mammary gland of a cow, detecting an intensity of transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland, effecting multivariate analysis by using a classification model based on probability, separability or similarity, and diagnosing the presence of the mastitis of the cow,~~

3. 14. (Currently amended) A method for diagnosing mastitis of cows, ~~comprising the steps of irradiating~~ ¹ set forth in claim 35 wherein the urine, raw milk or a mammary gland is irradiated with near infrared rays in a wavelength range of 700 nm to 1100 nm or 1100 nm to 2500 nm ~~into urine, raw milk or a mammary gland of a cow, detecting an intensity of transmitted light rays, reflected light rays or transmitted and reflected light~~

~~rays from said urine, raw milk or mammary gland, effecting multivariate analysis by using a classification model based on probability, separability or similarity, and diagnosing the presence of the mastitis of the cow.~~

4. 15. (Currently amended) The cow mastitis-diagnosing method set forth in any of claims ~~12 to 14~~ ^{1 2 43} ~~which comprising scanning 35, 13 and 14 wherein~~ wavelengths of incident rays, transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland are scanned, and applying wherein the multivariate analysis is applied to the thus obtained spectra of the visual light rays and/or the near infrared rays by using the classification model based on the probability, separability or similarity.

Claims 16-17 (Canceled)

B2 18. (Currently amended) An apparatus for ~~diagnosing mastitis of cows,~~ performing the method claimed in claim 35 for diagnosing whether a cow which is unknown to suffer from mastitis (hereinafter referred to as "unknown cow") suffers from mastitis or not, comprising:

~~a near infrared~~ an electromagnetic ray generator for generating visual light rays and/or near infrared rays in a wavelength range of 400 to 2500 nm;

an optical system for introducing the visual light rays and/or near infrared rays into urine, raw milk or a mammary gland of a cow;

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a detector for detecting an intensity of transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland; and

and a data processor for receiving signals from said detector, and effecting multivariate analysis by using a classification model based on probability, separability or similarity to diagnose the presence of the mastitis of the cow. effecting a principal component analysis of spectral data of the transmitted light rays, reflected light rays or transmitted and reflected light rays from said urine, raw milk or mammary gland, effecting a multivariate analysis of the spectral data consisting of wavelengths and detected intensities of the light rays by a principal component analysis, and preparing a SIMCA classification model for each of the known healthy cow group and the known mastitic cow group based on probability, separability or similarity, deciding which unknown cow fits better to either the SIMCA classification model for the healthy cow group or that for the mastitic cow group based on probability, separability or similarity, and judging that the unknown cow belongs to the cow group to which the unknown cow fits better.

19. (Currently amended) The cow mastitis-diagnosing apparatus set forth in claim 18, wherein said ~~near infrared~~ electromagnetic ray generator is an infrared ray generator for generating ~~a near~~ near infrared rays in a wavelength range of 700 to 2500 nm, an infrared ray generator for generating ~~a near~~ near infrared rays in a wavelength range of 700 to 1100 nm, or an infrared ray generator for generating ~~a near~~ near infrared rays in a wavelength range of 1100 to 2500 nm.

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20. (Currently amended) The cow mastitis-diagnosing apparatus set forth in
^{5 6}
claim 18 or 19 which further comprises an optical fiber from said ~~near-infrared~~
electromagnetic ray generator for introducing the visual light rays and/or near infrared rays
into said urine, raw milk or a mammary gland of the cow, and transmitted light rays,
reflected light rays or transmitted and reflected light rays from said urine, raw milk or
mammary gland is led to said detector through the optical fiber.

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21. (Previously presented) The cow mastitis-diagnosing apparatus set forth in
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claim 18 or 19, which further comprises a feeder for introducing said raw milk into a
sample container via an on-line or at line.

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22. (Previously presented) The cow mastitis-diagnosing apparatus set forth in
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claim 20, which further comprises a feeder for introducing said raw milk into a sample
container via an on-line or at line.

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23. (Previously presented) The cow mastitis-diagnosing apparatus set forth in
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claim 18 or 19, which further comprises a sample container for holding the raw milk, and a
temperature controller for stabilizing the milk inside the sample container to a given
temperature.

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24. (Previously presented) The cow mastitis-diagnosing apparatus set forth in
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claim 20, which further comprises a sample container for holding the raw milk, and a

temperature controller for stabilizing the milk inside the sample container to a given temperature.

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~~25~~. (Previously presented) The cow mastitis-diagnosing apparatus set forth in claim ~~21~~¹¹, which further comprises a sample container for holding the raw milk, and a temperature controller for stabilizing the milk inside the sample container to a given temperature.

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~~26~~. (Previously presented) The cow mastitis-diagnosing apparatus set forth in claim ~~22~~⁸, which further comprises a sample container for holding the raw milk, and a temperature controller for stabilizing the milk inside the sample container to a given temperature.

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Claims 27-34 (Canceled)

~~35.~~ (New) A method for diagnosing whether a cow which is unknown to suffer from mastitis (hereinafter referred to as "unknown cow") suffers from mastitis or not, comprising the steps of:

B3 (a) irradiating visible light rays and/or near infrared rays in a wavelength range of 400 to 2500 nm into urine, raw milk or a mammary gland of each of known healthy cows and known mastitic cows, detecting intensities of transmitted light rays, reflected light rays or transmitted and/or reflected light rays from said urine, raw milk or mammary gland, effecting a multivariate analysis of the spectral data consisting of wavelengths and detected intensities of the light rays by a principal component analysis, and preparing a SIMCA classification model for each of the known healthy cow group and the known mastitic cow group;

(b) irradiating visual light rays and/or near infrared rays in a wavelength range of 400 to 2500 nm into urine, raw milk or a mammary gland of said unknown cow, and detecting intensities of transmitted light rays, reflected light rays and/or transmitted and reflected light rays from said urine, raw milk or mammary gland; and

(c) determining whether the unknown cow fits better in either the SIMCA classification model for the healthy cow group or that for the mastic cow group based on probability, separability or similarity, to thereby diagnose whether the unknown cow suffers from mastitis or not.

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